

**UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
WACO DIVISION**

NITRIDE SEMICONDUCTORS CO., LTD.,

Plaintiff,

v.

LITE-ON TECHNOLOGY CORPORATION,
LITE-ON TECHNOLOGY USA, INC., LITE-
ON, INC., and LITE-ON TRADING USA,
INC.

Defendant.

Civil Action No. 6:21-cv-183

JURY TRIAL DEMANDED

COMPLAINT FOR PATENT INFRINGEMENT

Plaintiff Nitride Semiconductors Co., Ltd. (“NS”), for its Complaint against defendants Lite-On Technology Corporation, Lite-On Technology USA, Inc., Lite-On, Inc., and Lite-On Trading USA, Inc. (collectively, “Lite-On” or “Defendants”), alleges as follows:

INTRODUCTION

1. Plaintiff NS brings this patent infringement action to protect its valuable patented technology relating to ultraviolet (“UV”) light-emitting diode (“LED”) technology.

2. An LED is a semiconductor device that converts electrical energy into light.

3. LEDs have many advantages over conventional light sources, including lower energy consumption, longer lifetime, and smaller size.

4. UV LEDs emit invisible UV light at a wavelength less than about 380nm.

5. UV LEDs have a number of industrial, medical, health and hygiene applications.

These applications include, for example, water purification, sterilization, and disinfection applications.

6. NS was founded in 2000 out of the Nitride Semiconductor Laboratory at Tokushima University in Japan.

7. NS developed the world's first UV LED in 2000.

8. Prior to NS's introduction of UV LEDs, it was believed that the development of shorter wavelength UV LEDs was impossible as the emission efficiency from semiconductors at the shorter wavelength would rapidly deteriorate.

9. In 2000, NS succeeded in the development of the world's first high efficiency UV LED at a 350nm wavelength.

10. NS has continued to be a pioneer in UV LED technology.

11. NS makes and sells epitaxial wafers, UV LED chips, UV LED lamps, and UV LED appliances.

12. NS asserts that Lite-On's AlGaIn-based UV LEDs, or products containing its AlGaIn-based UV LEDs, infringe NS's U.S. Patent No. 6,861,270.

THE PARTIES

13. Plaintiff NS is a company organized and existing under the laws of Japan, with its principal place of business at 115-7, Itayajima, Akinokami, Seto-cho, Naruto-shi, Tokushima 771-0360, Japan.

14. Defendant Lite-On Technology Corporation is a publicly held Taiwanese corporation, traded on the Taiwanese Stock Exchange. Its global headquarters is located at 392 Ruey Kwang Road, Neihu District, Taipei City 114753, Taiwan, R.O.C. Lite-On Technology Corporation is the parent company of a group of wholly-owned subsidiaries (collectively, the "Lite-On Group") and manufactures and markets LED products including Lite-On's AlGaIn-based UV LEDs that are accused of infringement.

15. Defendant Lite-On Technology USA, Inc. is a Delaware Corporation, part of the Lite-On Group, and a wholly-owned subsidiary of Lite-On Technology Corporation. Lite-On Technology USA, Inc. sells and/or offers for sale in the United States LED products

manufactured by it and/or Lite-On Technology Corporation, including in the State of Texas and in this judicial district.

16. Defendant Lite-On, Inc. is a California corporation, part of the Lite-On Group, and a wholly-owned subsidiary of Lite-On Technology USA, Inc., with its principal place of business at 720 S. Hillview Drive, Milpitas, CA 95035, with sales offices in Texas.

17. Lite-On, Inc. may be served through its registered agent for service of process, CT Corporation System, 1999 Bryan Street, Suite 900, Dallas, Texas 75201.

18. Lite-On, Inc. is registered to do business in the State of Texas with a sales office at 1826 Kramer Lane, Building A, Suite D, Austin, TX 78758.

19. On information and belief, Lite-On has offices in the Western District of Texas where it sells, develops, and/or markets its products, including the aforementioned office in Austin.

20. Defendant Lite-On Trading USA, Inc. is a California corporation, part of the Lite-On Group, and a wholly-owned subsidiary of Lite-On Technology USA, Inc., with its principal place of business at 720 S. Hillview Drive, Milpitas, California 95035 and offices in Austin, TX, Houston, TX, and Plano, TX.

21. Lite-On Trading USA, Inc. lists an office on its website in the State of Texas with an address of 1826 Kramer Lane, Building A, Suite D, Austin, TX 78758.

22. Lite-On Trading USA, Inc. may be served through its registered agent for service of process, CT Corporation System, 1999 Bryan Street, Suite 900, Dallas, Texas 75201.

23. Lite-On Trading USA, Inc. is registered to do business in the State of Texas.

24. The Lite-On Group consists of related entities that operate as part of a corporate group or common business enterprise consisting of a number of related subsidiaries that operate under the Lite-On brand and infringe the Asserted Patents by making, using, importing, offering for sale, and/or selling substantially the same products.

25. The acts of infringement by each Defendant described herein arise out of the same transaction, occurrence, or series of transactions or occurrences relating to the making, using,

importing into the United States, offering for sale, or selling of the same accused products, namely the Lite-On's AlGaIn-based UV LEDs that are accused of infringement.

26. Lite-On Technology Corporation has legal and effective control over Lite-On Technology USA, Inc. and other Lite-On Group subsidiaries.

27. Lite-On Technology USA, Inc. has legal and effective control over Lite-On, Inc., Lite-On Trading USA, Inc., and other Lite-On Group subsidiaries.

JURISDICTION AND VENUE

28. This is an action for patent infringement, under the patent laws of the United States, 35 U.S.C. § 271 et seq. This Court has subject matter jurisdiction under 28 U.S.C. §§ 1331 and 1338(a).

29. Venue is proper within this judicial District under 28 U.S.C. §§ 1391(b)-(d) and 1400(b). Lite-On is registered to do business in the State of Texas, has offices in the State of Texas, and upon information and belief, has transacted business in the Western District of Texas and has committed acts of direct and indirect infringement in the Western District of Texas. Venue is proper in the Western District of Texas as Lite-On maintains a regular and established place of business in this District at 1826 Kramer Lane, Building A, Suite D, Austin, Texas 78758.

30. This Court has personal jurisdiction over Lite-On because, on information and belief, Lite-On, directly and/or through subsidiaries or intermediaries (including distributors, retailers, and others) is engaged in substantial and continuous business in this District, through its conduct of business, including testing, selling, offering for sale, and/or importing infringing products and services to customers. On information and belief, Lite-On also places or causes to have placed infringing products and services into the stream of commerce, with the knowledge that such products and services will be made, imported, sold, offered for sale, and/or used in this District. As such, Lite-On has purposefully availed itself of the privilege of conducting business within this District; has established sufficient minimum contacts with this District such that it should reasonably and fairly anticipate being haled into court in this District and would not

offend traditional notions of fair play and substantial justice; and has purposefully directed activities at residents of this State. Furthermore, at least a portion of the patent infringement claims alleged herein arise out of or are related to one or more of the foregoing activities. On information and belief, a substantial part of the events giving rise to NS's claims, including acts of patent infringement, have occurred in this District.

PATENT-IN-SUIT

31. On March 1, 2005, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 6,861,270 ("the '270 Patent"), entitled "Method for Manufacturing Gallium Nitride Compound Semiconductor and Light Emitting Element," to Professor Shiro Sakai. NS is the owner by assignment of the '270 Patent. A true and correct copy of the '270 Patent is attached hereto as Exhibit 1.

COUNT I

(PATENT INFRINGEMENT – '270 PATENT)

32. Plaintiff NS re-alleges and incorporates the allegations set forth in the preceding paragraphs of this Complaint as if fully set forth herein.

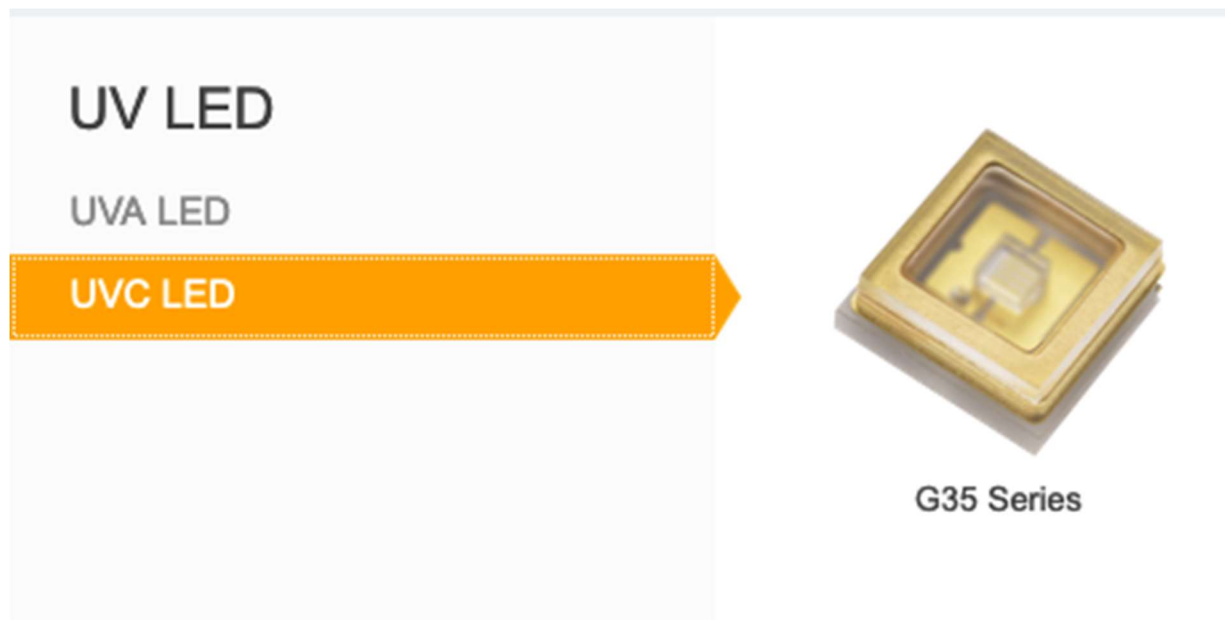
33. Lite-On has infringed and continues to infringe one or more claims of the '270 Patent pursuant to 35 U.S.C. § 271(a) at least by, without authority, using, offering to sell, and/or selling within the United States, or importing into the United States, infringing AlGaIn-based UV LEDs or products containing such LEDs, including, for example, UVC G35 Series products



including but not limited to LTPL-G35UV275GC-E, and UVA 1616 and 3535 Series products including but not limited to LTPL-C034UVH365. Screenshots of Lite-On's AlGaIn-based UV LED products as listed on its website¹ as of February 26, 2021 are shown below.

¹ <https://optoelectronics.liteon.com/en-global/led/LED-Component>

Part No.	View Angle	Outline Dimension	Wp (nm)	If (mA)	Vf (V)
LTPL-C16FUV365	135	1.6x1.6x1.38	365	20	3.5
LTPL-C16FUV375	135	1.6x1.6x1.38	375	20	3.5
LTPL-C16FUV385	135	1.6x1.6x1.38	385	20	3.3
LTPL-C16FUV395	135	1.6x1.6x1.38	395	20	3.2
LTPL-C16FUV405	135	1.6x1.6x1.38	405	20	3.1
Part No.	View Angle	Outline Dimension	Wp (nm)	If (mA)	Vf (V)
LTPL-C034UVD375	130	3.45x3.45x2.13	375	350	3.7
LTPL-C034UVD385	130	3.45x3.45x2.13	385	350	3.8
LTPL-C034UVD395	130	3.45x3.45x2.13	395	350	3.6
LTPL-C034UVD405	130	3.45x3.45x2.13	405	350	3.5
LTPL-C034UVD430	130	3.45x3.45x2.13	430	350	3.5
LTPL-C034UVE365	130	3.45x3.45x3.15	365	350	3.7
LTPL-C034UVG365	130	3.45x3.45x3.15	365	700	3.8
LTPL-C034UVG385	130	3.45x3.45x3.15	385	700	3.6
LTPL-C034UVG395	130	3.45x3.45x3.15	395	700	3.6
LTPL-C034UVG405	130	3.45x3.45x3.15	405	700	3.6
LTPL-C034UVH365	130	3.45x3.45x2.13	365	500	3.8
LTPL-C034UVH375	130	3.45x3.45x2.13	375	500	3.8
LTPL-C034UVH385	130	3.45x3.45x2.13	385	500	3.7
LTPL-C034UVH395	130	3.45x3.45x2.13	395	500	3.5
LTPL-C034UVH405	130	3.45x3.45x2.13	405	500	3.4
LTPL-C034UVH410	130	3.45x3.45x2.13	410	500	3.4
LTPL-C034UVH430	130	3.45x3.45x2.13	430	500	3.4



Part No.	View Angle	Outline Dimension	Wp (nm)	If (mA)	Vf (V)
LTPL-G35UV275GC-E	120	3.5*3.5*1.78	277	100	6.5
LTPL-G35UV275GR-E	120	3.5*3.5*1.78	277	180	6.5
LTPL-G35UVC275GC	120	3.5*3.5*1.78	275	100	6.3
LTPL-G35UVC275GH	120	3.5*3.5*1.78	275	600	6.7
LTPL-G35UVC275GM	120	3.5*3.5*1.78	275	300	6.5
LTPL-G35UVC275GR	120	3.5*3.5*1.78	275	150	6.0
LTPL-G35UVC275GZ	120	3.5*3.5*1.78	275	350	6.2

34. Lite-On also has infringed and continues to infringe pursuant to 35 U.S.C. § 271(g) at least by, without authority, importing into the United States or offering to sell, selling, and/or using within the United States infringing AlGaIn-based UV LEDs or products containing such LEDs, made using a process covered by one or more claims of the '270 Patent. The infringing AlGaIn-based UV LEDs made by the process claimed in the '270 Patent are not materially changed by subsequent processes and do not become a trivial and nonessential component of another product. At least to the extent Lite-On cannot satisfy any remedy granted

for infringement, there will be no adequate remedy for infringement on account of Lite-On's retail sale of the infringing AlGaIn-based UV LEDs.

35. Lite-On has infringed at least claim 9 (which depends from independent claim 8) of the '270 Patent pursuant to 35 U.S.C. § 271(a).

36. Claim 8 of the '270 Patent recites:

A light emitting element comprising a gallium nitride based semiconductor, the light emitting element comprising:

a substrate;

a first gallium nitride based semiconductor layer formed on the substrate, the first gallium nitride based semiconductor layer having a first surface;

a composition material of the first gallium nitride based semiconductor formed on less than a total area of the first surface; and

a second gallium nitride based semiconductor layer having a varied compositional ratio and formed on the first gallium nitride based semiconductor layer onto which the composition material is formed, and the second gallium nitride based semiconductor is a light emitting layer.

37. Claim 9 of the '270 Patent adds the following limitation: A light emitting element according to claim 8, wherein the first gallium nitride based semiconductor and the second gallium nitride based semiconductor are AlGaIn; and the composition is one selected from Ga and Al.

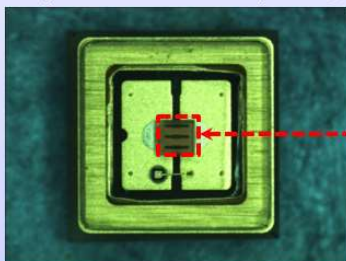
38. As set forth below, each of the limitations of claim 9 is satisfied, literally or under the doctrine of equivalents, by Lite-On's AlGaIn-based UV LEDs used, imported, sold, and/or offered for sale by Lite-On, including, for example, UVC G35 Series products including but not limited to LTPL-G35UV275GC-E, and UVA 1616 and 3535 Series products including but not limited to LTPL-C034UVH365.

39. As shown in the images below, the Lite-On AlGaIn-based UV LEDs each contain at least one light emitting element, which is an individual UV LED. The Lite-On AlGaIn-based UV LEDs themselves also each constitute a light emitting element, namely a "UV LED."

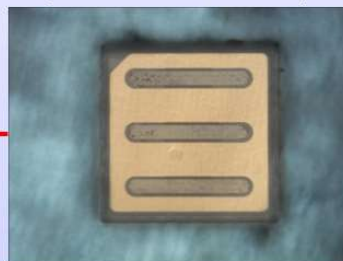
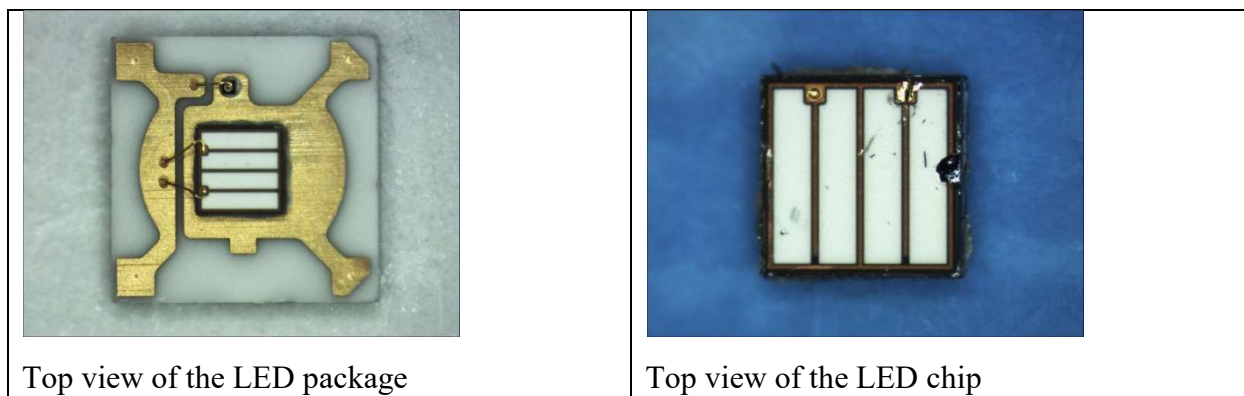
Label of the Product



Top View of the LED package



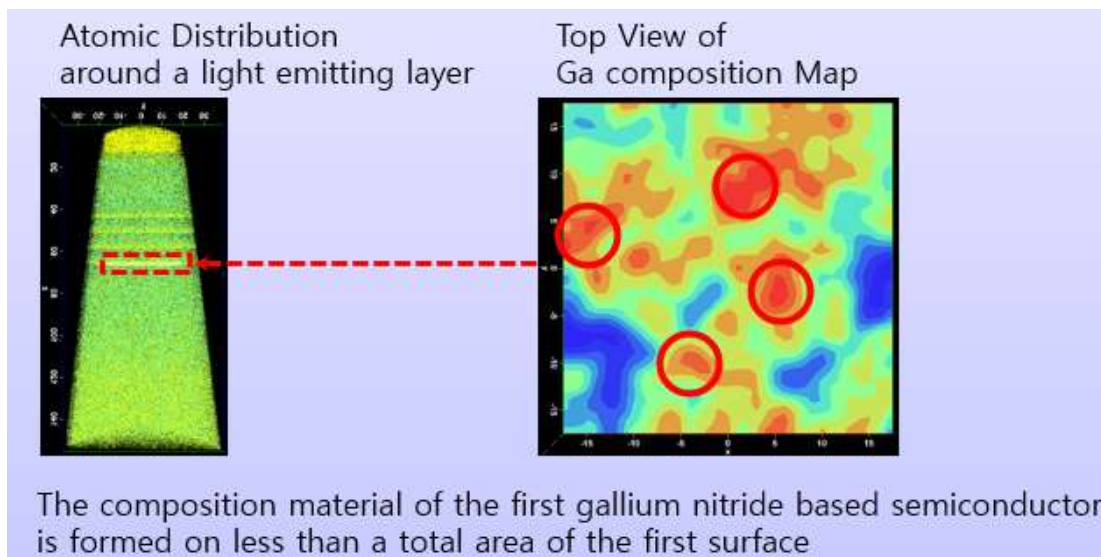
Top View of the LED chip

**LTPL-G35UV275GC-E****LTPL-C034UVH365**

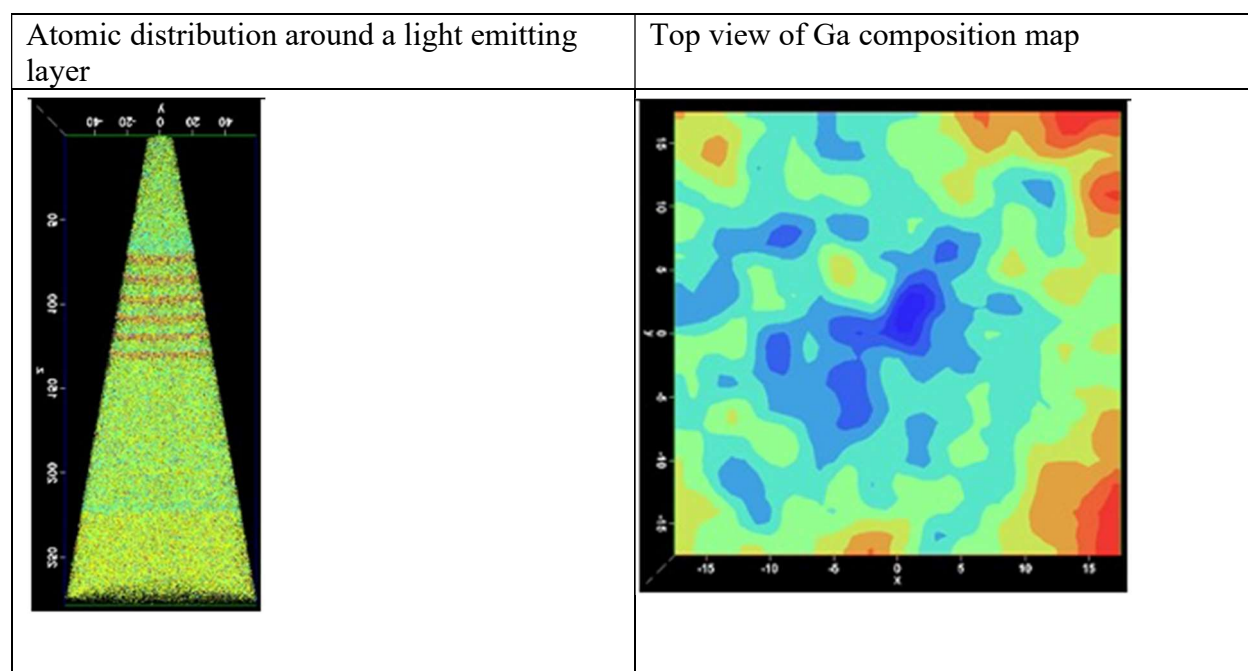
40. The Lite-On AlGa_N-based UV LEDs are each comprised of a gallium nitride based semiconductor. Analysis of LEDs shown below has shown that they are comprised of aluminum gallium nitride (AlGa_N), which is a gallium nitride based semiconductor.

41. The Lite-On AlGa_N-based UV LEDs include a substrate. See the cross section view of TEM images of LED chips below showing semiconductor layers formed on a substrate.

below are atomic distributions and top-down views in the selected areas corresponding with the APT data above showing areas of higher Ga concentration on the first surface.

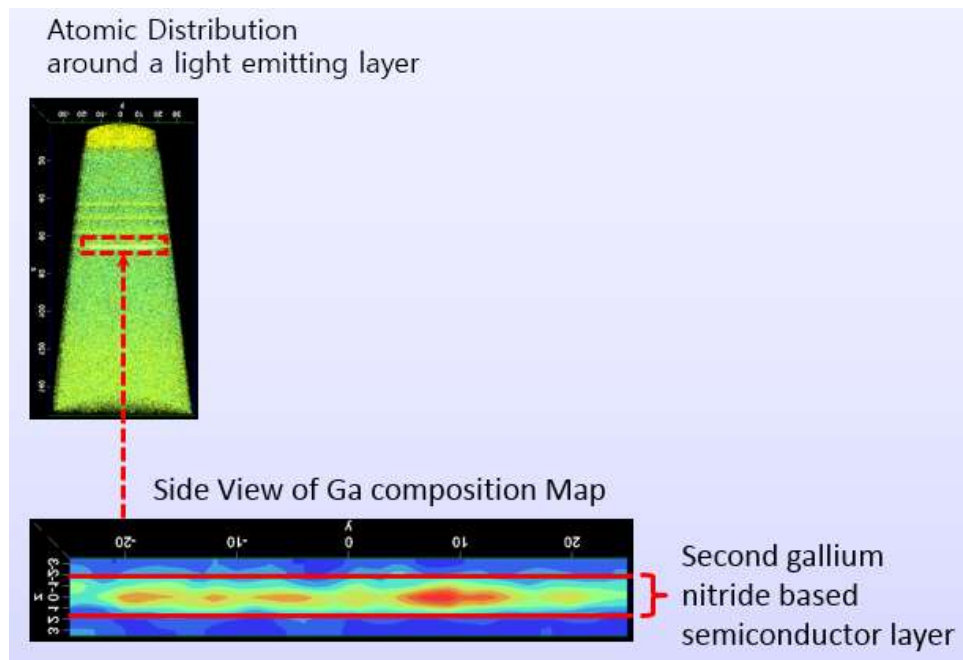


LTPL-G35UV275GC-E

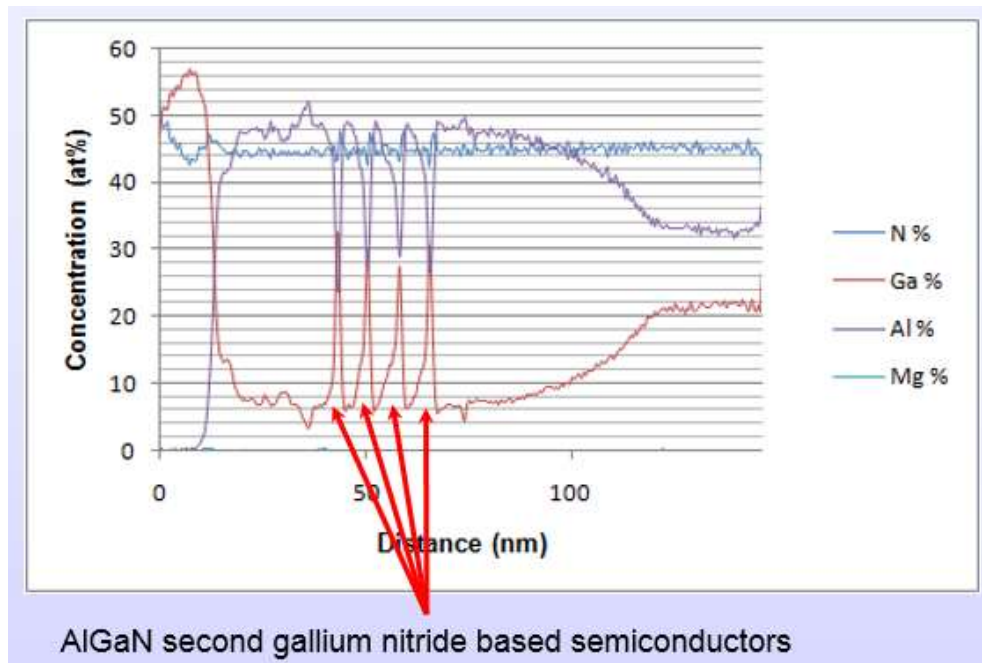


LTPL-C034UVH365

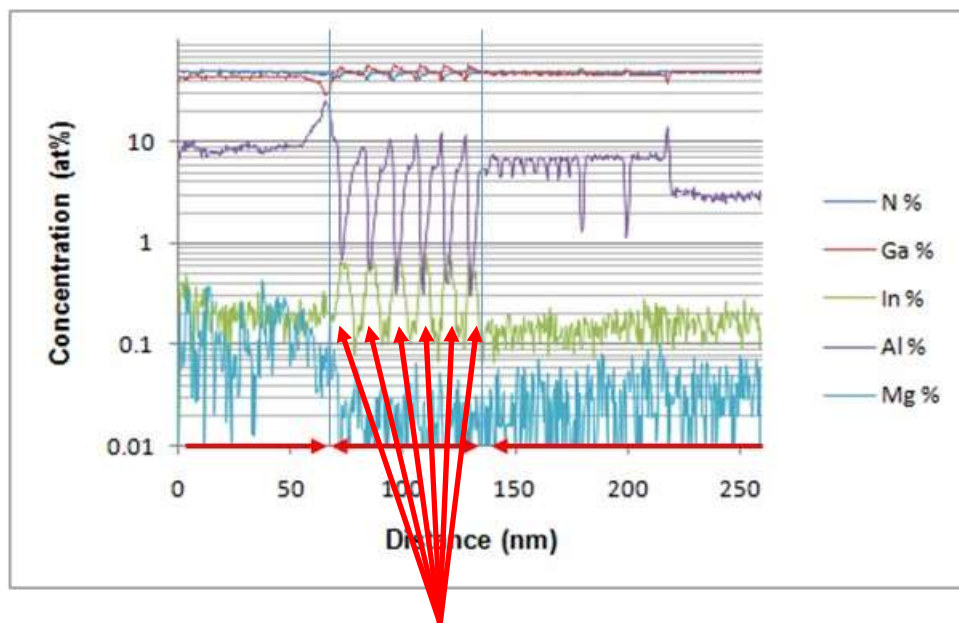
43. The Lite-On AlGaIn-based UV LEDs also comprise a second gallium nitride based semiconductor layer having a varied compositional ratio and formed on the first gallium nitride based semiconductor layer onto which the composition material is formed, and the second gallium nitride based semiconductor is a light emitting layer. Analysis has shown that the second gallium nitride based semiconductor layer is an AlGaIn layer having a varied compositional ratio due to having regions of higher Ga concentrations. This second gallium nitride layer is formed on the first gallium nitride layer onto which the Ga composition material was formed. The TEM data above shows variation in the compositional ratio in the second gallium nitride based semiconductor layer(s) via contrast in the TEM images, where low Ga concentrations are darker, and Ga-rich regions are brighter. The composition maps below show that Al concentrations are relatively less and Ga concentrations are relatively greater in the second gallium nitride based semiconductor layer(s) as compared to the first gallium nitride based semiconductor layer on which they are formed. This second gallium nitride based semiconductor layer is a light emitting layer.



LTPL-G35UV275GC-E



LTPL-G35UV275GC-E



LTPL-C034UVH365

44. The light emitting layer in the Lite-On AlGaIn-based UV LEDs emit UV light. For example, the datasheet for the LTPL-G35UV275GC-E indicates that it is a “UVC light

source.” Ex. 2 at 2. In particular, the LTPL-G35UV275GC-E emits a “peak wavelength” of UV light in the range 270-285 nm. *Id.* at 4. Likewise, the datasheet for the LTPL-C034UVH365 indicates that it is a “UV light source.” Ex. 3 at 2. In particular, the LTPL-C034UVH365 emits a wavelength of UV light with a “nominal peak wavelength” of 365 nm. *Id.*

45. On information and belief, Lite-On has infringed at least claim 2 (which depends from independent claim 1) of the ’270 Patent pursuant to § 271(g).

46. Claim 1 of the ’270 Patent recites:

1. A method for manufacturing a gallium nitride based semiconductor, comprising the steps of:

(a) forming a first gallium nitride based semiconductor on a substrate, the first gallium nitride based semiconductor having a first surface;

(b) forming on less than a total area of the first surface a composition material of the first gallium nitride based semiconductor; and

(c) forming a second gallium nitride based semiconductor on the first gallium nitride based semiconductor on which the composition material is formed; wherein a spatial fluctuation is created in the band gap by variation in the compositional ratio in the second gallium nitride based semiconductor created by the composition material, and the second gallium nitride based semiconductor is a light emitting layer.

47. Claim 2 of the ’270 Patent adds the following limitation: A method according to claim 1, wherein the first gallium nitride based semiconductor and the second gallium nitride based semiconductor are AlGa_N; and the composition material is one selected from Ga and Al.

48. As set forth below, each of the limitations of claim 2 is satisfied, literally or under the doctrine of equivalents, by Lite-On’s infringing products used, imported, sold, and/or offered for sale by Lite-On, including, for example, the Lite-On AlGa_N-based UV LEDs.

49. As stated above, each of the Lite-On AlGa_N-based UV LEDs are comprised of a gallium nitride based semiconductor. Analysis of the Lite-On AlGa_N-based UV LEDs has shown that they are comprised of aluminum gallium nitride (AlGa_N), which is a gallium nitride based semiconductor.

50. The method of manufacturing the Lite-On AlGaIn-based UV LEDs involves forming a first gallium nitride based semiconductor on a substrate. The first gallium nitride based semiconductor layer formed on the substrate is AlGaIn. This first gallium nitride based semiconductor layer in each LED has a first surface.

51. The method of manufacturing each of the Lite-On AlGaIn-based UV LEDs also comprises forming on less than a total area of the first surface a composition material of the first gallium nitride based semiconductor. Per above, analysis has shown that the composition material of the first gallium nitride based semiconductor is gallium (Ga) formed on less than a total area of the first surface.

52. The method of manufacture further comprises forming a second gallium nitride based semiconductor on the first gallium nitride based semiconductor on which the composition material is formed. Per above, analysis has shown that the second gallium nitride based semiconductor layer is an AlGaIn layer, which is formed on the first gallium nitride layer onto which the Ga composition material was formed. On information and belief, spatial fluctuation is created in the band gap by variation in the compositional ratio in the second gallium nitride based semiconductor created by the composition material, and the second gallium nitride based semiconductor is a light emitting layer. This spatial fluctuation in the band gap is illustrated, for example, in the '270 Patent as shown below.

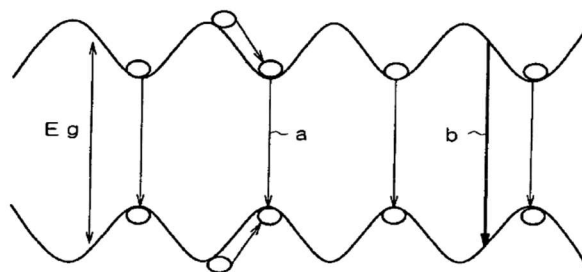


Fig. 4

CONCLUSION

53. Lite-On's infringement has caused and is continuing to cause damage and irreparable injury to NS. NS will continue to suffer damage and irreparable injury unless and until that infringement is enjoined by this Court, as a remedy at law alone would be inadequate.

54. NS is entitled to injunctive relief and damages in accordance with 35 U.S.C. §§ 271, 281, 283, and 284.

55. On information and belief, Lite-On has had such actual notice since at or near the filing date of the First Amended Complaint in *Nitride Semiconductors Co., Ltd. v. Digi-Key Corporation d/b/a Digi-Key Electronics*, 17-cv-04359-JRT-LIB (D. Mn. Aug. 10, 2020), rendering its infringement willful. Such willful infringement entitles NS to enhanced damages under 35 U.S.C. § 284 and a finding that this case is exceptional, entitling NS to an award of its reasonable attorneys' fees under 35 U.S.C. § 285.

PRAYER FOR RELIEF

WHEREFORE, NS respectfully requests that this Court enter judgment in its favor and against Lite-On as follows:

A. A declaration that Lite-On has infringed the '270 Patent under 35 U.S.C. § 271, and a final judgment incorporating the same;

B. A preliminary and permanent injunction, enjoining Lite-On and its officers, agents, servants, employees, representatives, successors, and assigns, and all others acting in concert or participation with them from continued infringement under 35 U.S.C. § 271 of the '270 Patent;

C. An award of damages adequate to compensate NS for Lite-On's infringement of the '270 Patent, together with prejudgment and post-judgment interest and costs pursuant to 35 U.S.C. § 284;

D. An order finding that Lite-On's infringement is willful and enhancing damages pursuant to 35 U.S.C. § 284;

E. An order finding that this is an exceptional case under 35 U.S.C. § 285 and awarding relief, including reasonable attorneys' fees, costs, and expenses;

F. An accounting of all infringing sales and other infringing acts by Lite-On, and an order compelling an accounting for infringing acts not presented at trial and an award by the Court of additional damages for such acts; and

G. Any other relief to which NS is entitled or that the Court deems just and proper.

JURY DEMAND

Pursuant to Rule 38(b) of the Federal Rules of Civil Procedure, NS hereby demands trial by jury of all issues so triable.

DATED: February 26, 2021

Respectfully submitted,

/s/ Kevin S. Kudlac

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